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EXAMINER

THANGAVELU, KANDASAMY

ART UNIT PAPER NUMBER

2123

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/868,270

Applicant(s)

GORDON, GRAHAM PAUL

Examiner

Kandasamy Thangavelu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) *
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-5 and 7-13 of the application have been examined.

Foreign Priority

2. Acknowledgment is made of the receipt of certified copies of applicant's foreign priority application 98/11657 dated December 18, 1998, and PCT application PCT/IB99/01989 dated December 14, 1999, which have been placed in the file.

Information Disclosure Statement

3. Acknowledgment is made of the information disclosure statements filed on July 20, 2001 together with copies of the patents and papers. The patents and papers have been considered in reviewing the claims.

Drawings

4. The drawings submitted on June 14, 2001 are accepted.

Claim Rejections - 35 USC § 103

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 3, 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gall et al.** ("Balancing in reverse engineering in object oriented systems engineering to improve reusability and maintainability", IEEE, 1994) in view of **Iyengar et al.** (U.S. Patent 6,018,627), and further in view of **Weinman, Jr.** (U.S. Patent 6,339,838) and **Grover** (U.S. Patent 6,421,349).

7.1 **Gall et al.** teaches Balancing in reverse engineering in object oriented systems engineering to improve reusability and maintainability. Specifically, as per claim 1, **Gall et al.** teaches a method of performing a system reverse engineering process on an application system (Page 35, CL1, Para 2); which includes the steps of:

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from the information gathered and recorded by the examination of the network structure forming the application system, formatting the information gathered into a form in which it represents the application system in a usable form (Page 36, CL2, Para 4, L6-8; Page 36, CL1, Para 1).

Gall et al. does not expressly teach gathering the entire application system that requires reverse engineering and identifying each development environment associated with the application system. **Iyengar et al.** teaches gathering the entire application system that requires reverse engineering and identifying each development environment associated with the application system (Abstract, L1-7; CL1, L9-12; CL2, L28-43; CL2, L46-52), because that allows storing the output data, application components and the relationship between entities and objects to be stored in the repository; in this way the system integrates the tools used in different parts of the development process by passing necessary information from one tool to another through the repository (Abstract, L3-7 and L10-14). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Iyengar et al.** that included gathering the entire application system that requires reverse engineering and identifying each development environment associated with the application system. The artisan would have been motivated because that would allow storing the output data, application components and the relationship between entities and objects to be stored in the repository; in this way the system would integrate the tools used in different parts of the development process by passing necessary information from one tool to another through the repository.

Gall et al. teaches a suitably programmed processing system, which is provided with a data base of object types in respect of which the nature, characteristics and properties are known (Page 36, CL1, Para 3; Page 36, CL2, Para 1). **Gall et al.** does not expressly teach a suitably programmed processing system, which is provided with a data base of object types in respect of which the nature, characteristics and properties are known and which fall in groups that include process or activity control elements, data management elements and interface elements.

Weinman, Jr. teaches a suitably programmed processing system, which is provided with a data base of object types in respect of which the nature, characteristics and properties are known and which fall in groups that include process or activity control elements, data management elements and interface elements (Abstract, L4-11; Fig. 4), because that allows interacting with an existing process (EP) to develop information that can be used to enhance EP process model; the modeling tool allows for modifying the model data; the code generation tool allows for the provision and delivery of an enhanced code to the EP process allowing an improved EP process (Abstract, L3-7 and L10-14). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Weinman, Jr.** that included a suitably programmed processing system, which is provided with a data base of object types in respect of which the nature, characteristics and properties are known and which fall in groups that include process or activity control elements, data management elements and interface elements. The artisan would have been motivated because that would allow interacting with an existing process (EP) to develop information that could be used to enhance EP process model; the modeling tool would allow for modifying the model data; the code generation tool would

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allow for the provision and delivery of an enhanced code to the EP process allowing an improved EP process.

Gall et al. teaches identifying the object types as being associated with the application system (Page 37, CL1, Para 1; the DFDs are developed from the structure charts). The DFDs developed in have the form of a network with nodes and links. The application system programs are in the form of a network with nodes and links. See **Weinman, Jr.** (CL14, L41-48 and Fig 4).

Gall et al. does not expressly teach identifying the object types, as determined by each development environment identified as being associated with the application system, that can serve as starting points from where an examination of the application system can be initiated.

Grover teaches identifying the object types, as being associated with the application system, that can serve as starting points from where an examination of the application system can be initiated (CL3, L16; CL3, L33-34), because that allows searching for and identifying a set of intermediate nodes, that together with the originating node may form a path or chain (CL3t, L17-20). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Grover** that included identifying the object types, as being associated with the application system, that can serve as starting points from where an examination of the application system can be initiated. The artisan would have been motivated because that would allow searching for and identifying a set of intermediate nodes, that together with the originating node could form a path or chain.

Gall et al. teaches identifying points, in the form of object instances of object types (Page 36, CL1, Para 3; Page 36, CL2, Para 1). **Gall et al.** does not expressly teach identifying entry points, in the form of object instances of object types identified to serve as starting points from

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where an examination of the application system can be initiated, for entering the system to carry out an examination of the system. **Grover** teaches identifying entry points, in the form of object instances of object types identified to serve as starting points from where an examination of the application system can be initiated, for entering the system to carry out an examination of the system (CL3, L17-20; CL3, L33-34), because that provides a method of establishing a connected route through the network (CL4, L24-26) and allows restoring networks upon occurrence of failure of one of the links or nodes of the network (CL1, L6-9). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Grover** that included identifying entry points, in the form of object instances of object types identified to serve as starting points from where an examination of the application system can be initiated, for entering the system to carry out an examination of the system. The artisan would have been motivated because that would provide a method of establishing a connected route through the network and would allow restoring networks upon occurrence of failure of one of the links or nodes of the network.

Gall et al. does not expressly teach examining from selected entry points the network structure forming the application system by tracking chains of nodes and links, each chain being tracked until the instance of a node that does not have a link or the return of the chain to a previously examined node. **Grover** teaches examining from selected entry points the network structure forming the application system by tracking chains of nodes and links, each chain being tracked until the instance of a node that does not have a link or the return of the chain to a previously examined node (CL3, L23-26), because that provides a method of establishing a connected route through the network (CL4, L24-26) and allows restoring networks upon

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occurrence of failure of one of the links or nodes of the network (CL1, L6-9). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Grover** that included examining from selected entry points the network structure forming the application system by tracking chains of nodes and links, each chain being tracked until the instance of a node that does not have a link or the return of the chain to a previously examined node. The artisan would have been motivated because that would provide a method of establishing a connected route through the network and would allow restoring networks upon occurrence of failure of one of the links or nodes of the network.

Gall et al. does not expressly teach reverse tracking the chain to a node from which another chain extends and selectively tracking said other chain. **Grover** teaches reverse tracking the chain to a node from which another chain extends and selectively tracking said other chain (CL12, L40-54; CL13, L1-9), because that provides a method of establishing a restoration path for a failed span (CL13, L5-6) and allows restoring networks upon occurrence of failure of one of the links or nodes of the network (CL1, L6-9). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Grover** that included reverse tracking the chain to a node from which another chain extends and selectively tracking said other chain. The artisan would have been motivated because that would provide a method of establishing a restoration path for a failed span and would allow restoring networks upon occurrence of failure of one of the links or nodes of the network.

Gall et al. does not expressly teach continuing the process until all the chains within the network structure have been tracked completely, the tracking of the chains including an

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examination of each node and each link in the network structure, to the extent that the nature, characteristics and properties of each node and each link can be associated with object types through analysis and understanding thereof, and gathering and recording all the information of each node and each link. **Grover** teaches continuing the process until all the chains within the network structure have been tracked completely, the tracking of the chains including an examination of each node and each link in the network structure, to the extent that the nature, characteristics and properties of each node and each link can be associated with object types through analysis and understanding thereof, and gathering and recording all the information of each node and each link (CL4, L32-38; CL12, L40-49), because that provides a method of establishing a connected route through the network (CL4, L24-26) and allows restoring networks upon occurrence of failure of one of the links or nodes of the network (CL1, L6-9). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Grover** that included continuing the process until all the chains within the network structure have been tracked completely, the tracking of the chains including an examination of each node and each link in the network structure, to the extent that the nature, characteristics and properties of each node and each link can be associated with object types through analysis and understanding thereof, and gathering and recording all the information of each node and each link. The artisan would have been motivated because that would provide a method of establishing a connected route through the network and would allow restoring networks upon occurrence of failure of one of the links or nodes of the network.

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7.2 As per claim 3, **Gall et al., Iyengar et al., Weinman, Jr. and Grover** teach the method of claim 1. **Gall et al.** teaches the examination of each node and each link in the chain of the network structure forming the application system, while tracking the chains, includes a comparison and classification of nodes and links as object instances of object types to establish whether they conform with known object types included in the database of the processing system used (Page 36, CL1, Para 3 and Page 36, CL2, Para 1 and 4) or unknown object types and where they conform with unknown object types, identifying the nature, characteristics and properties of these unknown object types and then including them in the said database to become known object types (Page 36, CL1, Para 3 and Page 36, CL2, Para 1 and 4).

7.3 As per claim 4, **Gall et al., Iyengar et al., Weinman, Jr. and Grover** teach the method of claim 1. **Gall et al.** teaches formatting the information gathered and recorded, by the examination of the network structure forming the application system, into a format into which the information can be exported/reported to at least one of a computer aided software/ systems engineering tool, a development environment and a repository, which will enable the creation of a model of the application system (Page 36, CL2, Para 4, L6-8; Page 36, CL1, Para 1).

7.4 As per Claim 9, it is rejected based on the same reasoning as Claim 4, supra. Claim 9 is a method claims reciting the same limitations as Claim 4, as taught throughout by **Gall et al., Iyengar et al., Weinman, Jr. and Grover**.

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8. Claims 2, 7, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gall et al.** ("Balancing in reverse engineering in object oriented systems engineering to improve reusability and maintainability", IEEE, 1994) in view of **Iyengar et al.** (U.S. Patent 6,018,627), **Weinman, Jr.** (U.S. Patent 6,339,838) and **Grover** (U.S. Patent 6,421,349), and further in view of **Zgarba et al.** (U.S. Patent application 2002/0170048).

8.1 As per claim 2, **Gall et al.**, **Iyengar et al.**, **Weinman, Jr.** and **Grover** teach the method of claim 1.

Gall et al. does not expressly teach in identifying each development environment associated with the application system, identifying aspects of each development environment selected from the mechanisms of storage of data, the interface of the above, component libraries and code management systems. **Iyengar et al.** teaches in identifying each development environment associated with the application system, identifying aspects of each development environment selected from the mechanisms of storage of data, the interface of the above, component libraries (Abstract, L5-7; C12, L38-40) and code management systems (CL11, L10-15), because that allows storing the output data, application components and the relationship between entities and objects to be stored in the repository; in this way the system integrates the tools used in different parts of the development process by passing necessary information from one tool to another through the repository (Abstract, L3-7 and L10-14); and code management systems allow the resulting component code to be versioned using off-the-shelf code management tools (C111, L10-12). It would have been obvious to one of ordinary skill in the art

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at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Iyengar et al.** that included in identifying each development environment associated with the application system, identifying aspects of each development environment selected from the mechanisms of storage of data, the interface of the above, component libraries and code management systems. The artisan would have been motivated because that would allow storing the output data, application components and the relationship between entities and objects to be stored in the repository; in this way the system would integrate the tools used in different parts of the development process by passing necessary information from one tool to another through the repository; and code management systems would allow the resulting component code to be versioned using off-the-shelf code management tools.

Gall et al. does not expressly teach in identifying each development environment associated with the application system, identifying aspects of each development environment selected from a group including programming language and syntax used. **Zgarba et al.** teaches in identifying each development environment associated with the application system, identifying aspects of each development environment selected from a group including programming language and syntax used (Page 3, Para 0036 and 0037), because that allows source code written in a particular programming language to be reverse engineered into a new software model and then forward engineered from software model into a new set of source code (Page 3, Para 0037); and the software model to be kept up to date with the changing source code allowing generation of easily understood diagrammatic representations of the software (Page 1, Para 0004). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Zgarba et al.** that included in identifying

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each development environment associated with the application system, identifying aspects of each development environment selected from a group including programming language and syntax used. The artisan would have been motivated because that would allow source code written in a particular programming language to be reverse engineered into a new software model and then forward engineered from software model into a new set of source code; and the software model to be kept up to date with the changing source code allowing generation of easily understood diagrammatic representations of the software.

8.2 As per Claims 7, 8 and 10, these are rejected based on the same reasoning as Claims 3, 4 and 4, supra. Claims 7, 8 and 10 are method claims reciting the same limitations as Claims 3, 4 and 4, as taught throughout by **Gall et al.**, **Iyengar et al.**, **Weinman, Jr.**, **Grover** and **Zgarba et al.**

9. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gall et al.** ("Balancing in reverse engineering in object oriented systems engineering to improve reusability and maintainability", IEEE, 1994) in view of **Iyengar et al.** (U.S. Patent 6,018,627), **Weinman, Jr.** (U.S. Patent 6,339,838) and **Grover** (U.S. Patent 6,421,349), and further in view of **Litt et al.** (U.S. Patent 6,635,469) and **Digalakis et al.** (U.S. Patent 6,256,607).

9.1 As per claim 5, **Gall et al.**, **Iyengar et al.**, **Weinman, Jr.** and **Grover** teach the method of claim 4.

Gall et al. does not expressly teach formatting includes breaking structures into candidate components by using affinity analysis. **Litt et al.** teaches formatting includes breaking structures into candidate components by using affinity analysis (CL23, L63 to CL24, L2), because that provides a separation technique using physical size or by affinity extraction (CL57-62). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Litt et al.** that included formatting includes breaking structures into candidate components by using affinity analysis. The artisan would have been motivated because that would provide a separation technique using physical size or by affinity extraction.

Gall et al. does not expressly teach formatting includes breaking structures into candidate components by using mathematical clustering techniques. **Digalakis et al.** teaches formatting includes breaking structures into candidate components by using mathematical clustering techniques (CL10, L64-66), because that allows efficient numerical encoding of data for use in automatic recognition systems (CL1, L7-9). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Gall et al.** with the method of **Digalakis et al.** that included formatting includes breaking structures into candidate components by using mathematical clustering techniques. The artisan would have been motivated because that would allow efficient numerical encoding of data for use in automatic recognition systems.

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9.2 As per Claim 12, it is rejected based on the same reasoning as Claim 5, supra. Claim 12 is a method claims reciting the same limitations as Claim 5, as taught throughout by **Gall et al.**, **Iyengar et al.**, **Weinman, Jr.**, **Grover**, **Litt et al.** and **Digalakis et al.**

10. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gall et al.** ("Balancing in reverse engineering in object oriented systems engineering to improve reusability and maintainability", IEEE, 1994) in view of **Iyengar et al.** (U.S. Patent 6,018,627), **Weinman, Jr.** (U.S. Patent 6,339,838), **Grover** (U.S. Patent 6,421,349) and **Zgarba et al.** (U.S. Patent application 2002/0170048, and further in view of **Litt et al.** (U.S. Patent 6,635,469) and **Digalakis et al.** (U.S. Patent 6,256,607).

10.1 As per Claims 11 and 13, these are rejected based on the same reasoning as Claim 5, supra. Claims 11 and 13 are method claims reciting the same limitations as Claim 5, as taught throughout by **Gall et al.**, **Iyengar et al.**, **Weinman, Jr.**, **Grover**, **Zgarba et al.**, **Litt et al.** and **Digalakis et al.**

Conclusion

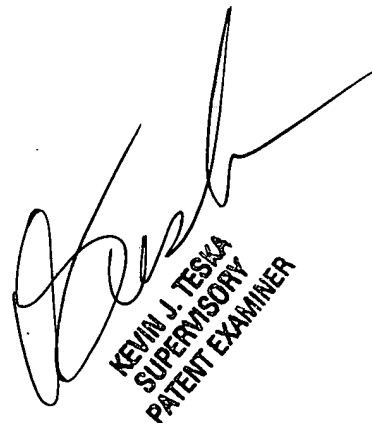
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu
Art Unit 2123
October 30, 2004



KEVIN J. TESKA
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